# Road Construction Practices Near the Upper Adams River – Blue River, BC

**Complaint Investigation 980179**

**FPB/IRC/25**

**March 2000**

# The Investigation

On February 18, 1999, the Board received a complaint that Gilbert Smith Forest Products (the licensee) was responsible for poor road building practices on the Storm Creek Road. The Storm Creek Road is located in the Clearwater Forest District, and provides access to cutblocks beside the upper Adams River, near Blue River, BC.

## Background

The complainant is an experienced forest worker who is familiar with road construction practices. He traveled on the Storm Creek Road when he worked in the upper Adams River area for about two months between June and September of 1998. During that time, the complainant observed what he considered to be poor road construction practices.

On October 1, 1998, the complainant reported his concerns to the Ministry of Forests in Clearwater. The ministry investigated and reported to the complainant that it had no concerns with the licensee's operations. The complainant then submitted a complaint to the Board.

Due to extremely high snowpack and late snow melt, it was not possible to visit the site until late August 1999.

The Board investigation focused on whether the requirements of the Forest Practices Code were met, specifically:

- Were road construction practices consistent with the requirements of the Code?
- Was government enforcement of the Code appropriate?

# Investigation Findings

## Road Construction Practices

The complainant identified four examples of what he considered to be poor road construction practices: an improper stream crossing, winter road building, uncontrolled blasting and excessive sidecasting. The complainant provided photographs of the stream crossing and the blast area to support his complaint. An examination of the four issues raised in the complaint follows.

a) Stream Crossing

The complainant provided a photograph of a stream crossing at Armour Creek, on the Storm Creek Road. Armour Creek is a tributary of the Adams River. The complainant said he had never seen such a structure before, and he was concerned that it could fail and impact fish habitat in the Adams River, about 800 metres below. The crossing was the first structure of its kind in the district, however the licensee has since built similar structures elsewhere.

The crossing consists of large boulders placed in the stream channel with a half-metre thick gravel road surface on top. The crossing was built to allow water to flow through the gaps between the boulders, but also to permit vehicles to drive across. Three culverts were placed near the top of the crossing to handle water overflow. The licensee proposed this type of crossing as an alternative to a much larger bridge that would have required more disturbance to the stream banks and adjacent slopes. The Ministry of Forests and other resource agencies approved the crossing, even though it was unusual, because they considered it a reasonable proposal for this location.

At the crossing site, Armour Creek is more than three metres wide. It flows down a steep slope and joins the upper Adams River approximately 800 metres below the crossing. Because of the steep slope, Armour Creek is classified as an S5 stream, meaning that no fish are present. Bull trout are known to inhabit the upper Adams River at the location below the crossing and salmon inhabit the Adams River about five kilometres downstream from Armour Creek.

The crossing was approved on May 16, 1995. The exact date of construction is not known, but a geological engineer noted that the crossing was partially constructed on June 29, 1995. The geological engineer stated that the crossing was suitable for the stream.

The Board does not have the jurisdiction to investigate matters that took place before the Code came into effect. However, forest practices that took place after June 15, 1995, had to comply with the Code. Based on the geological engineer's observations and suggestions, the Board concluded that some work was done on the stream crossing after the Code came into effect.

The investigation considered whether the crossing was constructed in accordance with Code requirements and whether there were any reasons to be concerned with the crossing.

Section 13 of the *Forest Road Regulation* specifies requirements for constructing drainage systems. For example, crossings must be constructed to maintain surface drainage patterns and must be constructed of erosion-resistant material capable of withstanding vehicle traffic. Additionally, crossings must minimize the amount of sediment entering streams and prevent the ponding of water where road stability may be compromised.

The stream crossing maintains surface drainage patterns, and was constructed with erosion-resistant material capable of withstanding vehicle traffic. In August, the crossing was stable and was not contributing sediment to the stream. During construction, the licensee placed geotextile fabric between the road surface material and the boulders to minimize the introduction of sediment into the stream.

Water was flowing through the three overflow culverts and between the large boulders at the base of the crossing. However, water was also pooling behind the crossing. The pool of water behind the crossing indicates that it partially blocks and confines the stream. The Board was concerned because road failures can be attributed to the pooling of water.

In response to the Board's concern, the licensee retained a geological engineer to evaluate the stability of the crossing. The geological engineer concluded that the standing pool of water, even in periods of high water flow, could not cause a failure of the crossing because the pool did not exert enough pressure on the crossing. The Board accepts the geological engineer's evaluation.

Since the field investigation, the licensee has advised the Board that it has installed a fourth overflow culvert to prevent pooling behind the crossing.

The Board also raised the possibility that a debris torrent could strike the crossing from above, knocking it out and potentially impacting fish habitat downstream. The licensee's geological engineer evaluated that possibility. The geological engineer calculated that the crossing has a safety factor of at least 1.87. This means that the crossing could withstand almost twice as much force as any debris torrent that would reach the crossing could exert, based on the geological engineer's evaluation. The geological engineer concluded that, based on his design, a debris torrent would not cause the crossing to fail upon impact. The Board accepts the geological engineer's evaluation that the crossing is stable.

**Finding 1:**

The crossing was constructed in accordance with the drainage construction requirements of the *Forest Road Regulation*.

The licensee stated that gravel accumulates on the upstream side of the crossing and must be removed twice a year in the spring and fall. The licensee plans to maintain the crossing as long as the road is in use. When the road is no longer needed, the licensee plans to deactivate it by removing the road surface material and the culverts. Armour Creek will flow over and through the remaining boulders.

b) Winter Road Construction

The complainant stated that the licensee constructed roads in the winter and mixed organic material and snow into the road surface. The complainant did not actually see road construction activities take place in the winter, because he worked in the area between June and September 1998. However, he stated that the roads were muddy and rutted, indicating the presence of organic material in the road prism. The complainant also said that he saw tension cracks in the road. Tension cracks indicate unstable road fill.

The licensee confirmed that part of the Storm Creek Road was constructed during the winter of 1996-1997. The Code does not prohibit the construction of roads in the winter. However, section 11(1)(c) of the *Forest Road Regulation* states that a person constructing a road must remove stumps, roots, embedded logs, topsoil, and soil incapable of supporting the road and vehicles from the road prism.

A ministry employee inspected the construction of the Storm Creek Road on January 7, 1997. In his inspection report he stated, "This road is coming along nicely. There has been a great job of removing the snow from the road area. This way no snow is being mixed into the road prism." The employee inspected road construction activities again on January 31. His inspection report noted that the road looked good. The employee did not record problems with organic material or snow in the road prism.

The licensee did not construct any of the road during the winter of 1997-98.

During the field inspection in August 1999, the investigator did not see evidence of organic material in the road prism, tension cracks, or rutted roads. The complainant accepted that the road would have looked fine during the summer, but maintains that it would have looked different in the spring.

**Finding 2:**

At the time of the field investigation, there was no evidence of a contravention of section 11(1)(c) of the *Forest Road Regulation*.

c) Uncontrolled Blasting

The complainant provided a photograph of what he considered to be uncontrolled blasting where the licensee constructed the Storm Creek Road through a steep rock bluff section. A quarter-hectare area below the road was covered with blasted rock and some standing trees were knocked over.

A geological engineer reviewed the proposed route before the road was constructed. He noted that the route crossed an area of exposed, steep rock, and estimated that the rock intersected the proposed route at angles of 70 to 90 degrees. The geological engineer noted that the rock structure was generally favorable to allow vertical blasted cuts.

The licensee built a rough trail up onto the top of the rock and drilled down into it, as suggested by the geological engineer. Explosives were placed in the drill holes and three blasts were used to progressively remove the rock.

According to the licensee, the angle of the rock face was so steep that the rock simply fell or rolled down the slope after it was blasted, due to gravity. After blasting was complete, the licensee was unable to retrieve all of the rock with his equipment. The majority of the rock came to rest in an avalanche chute that was already covered with rock, but some fell or rolled into the surrounding timber.

Section 12(1)(d) of the *Forest Road Regulation* requires, in part, that a person who constructs a road through rock must use only rock drilling and blasting techniques that minimize fly rock and disturbance to forest resources. Fly rock is airborne rock displaced by blasting.

If the blast was uncontrolled, one would expect to see evidence of fly rock, including scars in the bark of surrounding trees, or rocks embedded in trees. There was no evidence of fly rock. It appears that the rock did fall down the slope under the force of gravity.

Most of the rock settled in an avalanche chute that was already covered in rock. The investigator estimated that 20 to 30 trees were knocked down by the falling rock and subsequently retrieved by the licensee. There was minimal disturbance to forest resources.

The Board understands why the complainant felt that the blast could have been controlled better. Some of the rock did fall into the surrounding timber, which is farther than might be expected. However, the Board is also aware of the challenges that the licensee faced in this situation. Due to the steep rock, the licensee was not able to construct a pilot trail below the blast area to catch the falling rock. The licensee also pointed out that even if a pilot trail could have been constructed, it would have been impossible to haul the rock back up the 30 to 40 percent slope, and the trail would have disturbed additional mature timber.

The Board considers that the licensee controlled the blast as much as possible given the site conditions.

**Finding 3:**

The licensee used rock drilling and blasting techniques that minimized fly rock and disturbance to forest resources, in accordance with the section 12(1)(d) of *the Forest Road Regulation*. Some rock did fall or roll into standing trees, but this was unavoidable and created little or no disturbance to forest resources.

d) Sidecasting

The *Forest Road Regulation* defines "sidecast" as the act of moving excavated material onto the downslope side of a road during road construction. The practice can overload the slope and contribute to instability, especially in steep terrain. The alternative to sidecasting is to load the excavated material onto a truck and to haul it to another section of the road, or a disposal site where stability is not a concern. This process is called 'endhauling'. Endhauling is more expensive than sidecasting due to the extra loading and hauling of excavated material.

The complainant stated that the licensee was sidecasting excavated material along the Storm Creek Road instead of endhauling.

The Code does not specifically prohibit sidecasting during road construction. However, section 8(1)(g) of the *Forest Road Regulation* states that a road layout and design must specify measures to maintain slope stability if the road will cross areas with a moderate or high likelihood of landslides. In this case, endhauling would be considered a measure to maintain slope stability.

A review of the road layout and design revealed that endhauling was required at some locations. In a geotechnical review of the road, the geological engineer also noted areas where endhauling would be required. The road permit required that the licensee observe all endhaul requirements specified by the geological engineer.

Endhauling was conducted in accordance with the road layout and design, and endhaul disposal sites were evident in the field.

**Finding 4:**

The road layout and design and the geotechnical review of the road specified road sections where endhauling was required. During construction, the licensee complied with Code requirements by endhauling excavated material to disposal sites and other sections of the road, in accordance with the road layout and design and the geotechnical review.

## Appropriateness of Government Enforcement

The complainant told the Ministry of Forests about his concerns on October 1, 1998. The complainant was concerned with timber waste levels, road construction practices and general harvesting methods. The complainant did not specifically mention his concern about the crossing at Armour Creek.

The ministry conducted an investigation and visited the licensee's operation later that month. The ministry did not investigate the Armour Creek crossing because the complainant did not raise it as a concern. On November 9, 1998, the ministry reported the results of its investigation to the complainant in writing. The ministry reported that compliance with all pertinent legislation and operational plans was good. As a result, it did not pursue the matter further.

With the knowledge that the Ministry of Forests had already investigated some of the matters raised by the complainant, the Board examined the appropriateness of government enforcement of the Code.

Enforcement includes conducting inspections to respond to public concerns and investigating any possible contraventions. In this case, the ministry investigated and reported the results of its investigation to the complainant five weeks after receiving his complaint. The ministry did not identify any contraventions of the Code, either through routine inspections, or in response to the complainant's concerns. As a result, no enforcement action took place. The Board's findings confirm the ministry's position that the Code was not contravened.

The Board considers the ministry's response to the complaint to be prompt and appropriate.

**Finding 5:**

Government enforcement of the Code was appropriate in the circumstances of the complaint.

# Conclusions

The complainant provided four examples of what he considered to be poor road construction practices along the Storm Creek Road: an improper stream crossing, winter road building, uncontrolled blasting and sidecasting. The Board investigated the four issues and found that practices complied with the requirements of the Code.

The stream crossing at Armour Creek is unusual, but it does comply with Code requirements. It is a suitable structure for that site. It appears to be stable and poses little risk to fish habitat. Periodic maintenance is required and the licensee plans to remove road surfacing materials and the culverts when the road is no longer used.

The licensee also complied with Code requirements to minimize fly rock during blasting. More rock than expected fell or rolled into standing trees, but this was unavoidable and did little or no damage to forest resources. The licensee controlled the blast as much as possible given the site conditions.

The Ministry of Forests responded promptly to the complainant's concerns, and ministry enforcement of the Code was appropriate.

*The single person panel of the Board that concluded this report was Keith Moore.*

# Road Construction Practices Near the Upper Adams River